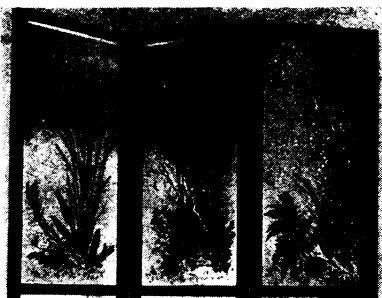


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ASTRONOMY

Study Moon Craters

Theories on the origin of the moon's craters include collisions between the moon and comets, according to one theory, or meteorites, according to another.

➤ COMETS smashing into the moon's surface caused the largest of its craters, Dr. Zdenek Kopal of the University of Manchester reports.

The present, widely held theory is that most lunar craters were formed by collisions with meteorites or asteroids. Dr. Kopal believes that if this were so, the many steep mountains and ridges now visible would have disappeared long ago because they would have been leveled by earthquake-like actions when the asteroids or meteorites exploded.

An American scientist, Dr. William G. Van Dorn of Scripps Institution of Oceanography, La Jolla, Calif., disagrees with Dr. Kopal's view. Arguments supporting both theories are reported in *Nature* (March 14).

The question of the origin of lunar craters and the maria, or seas, has recently been reopened due to observations, by the Russian astronomer Prof. N. A. Kozyrev of Pulkovo Observatory near Leningrad, of gas escaping from the central peak of the lunar crater Alphonsus.

Dr. Kopal believes the theory of collisions

with meteorites or small asteroids is seriously incomplete, and should be re-examined without regard to the observations of Prof. Kozyrev. Since comet heads are composed mainly of frozen hydrocarbons, they would release chemical energy in addition to the energy of their motion when smashing into the moon's surface.

This impact would not indent the lunar surface but would turn the rocks in the immediate area into lava, thus accounting for the maria. Dr. Kopal suggests the gas discharge observed by Prof. Kozyrev could result from accidental release of some gas deposited in Alphonsus by collision with a comet in the distant past.

Dr. Van Dorn cites the results of the Ranier underground atomic test in Nevada to show very little lava, if any, would be caused by a comet collision. Although he agrees that moonquakes could occur when sufficiently large objects strike the moon, Dr. Van Dorn believes the energy would not be enough for effects to be felt much beyond the impacting area.

Science News Letter, March 28, 1959

PHYSIOLOGY

Artificial Bladder Used

A new surgical technique has made it possible to give an individual with a diseased or malfunctioning bladder an artificial one to replace it.

➤ AN ARTIFICIAL bladder that carries urine to the outside of the body in a normal manner with full control is now a reality.

This bladder is possible due to a new surgical technique devised by Dr. Charles L. Reynolds of the Dallas Veterans Administration Hospital. The operation employs a segment of small intestine as a bladder for patients with cancer or other disease requiring removal of the bladder.

The operation has been performed on two veterans. The first patient, a 38-year-old man, volunteered for the operation after suffering more than ten years with a bladder diseased by a pre-cancerous lesion. The second operation was performed on another veteran last December. The first operation was completely successful. Present evidence indicates the second is also successful. More time will have to elapse to permit a definite conclusion, however.

The new technique involves removing the bladder completely. Then a segment of the small intestine, about eight to ten inches long, is cut out and left loosely attached to the blood supply within the body. The bowel is rejoined.

Then the segment is swung down in

the abdomen and attached to the urethra at about a midway point in an approximate "T" shape and one end of the segment is closed.

The ureters, or tubes from the kidneys to the bladder, are then attached to the segment. For five or six weeks the open end of the segment is attached to the skin to drain outside the body to clear mucus and infection. Later the artificial bladder is enclosed inside the body.

One delicate phase of the operation is attaching the ureters to the artificial bladder at the proper slant and precise point to create a valve-like action when the bladder is distended or contracted.

The operation itself is still in the investigative stages, Dr. Reynolds cautioned. The Veterans Administration describes the operation, a result of nearly three years of research, as "a true achievement in this type of surgery."

The surgery devised by Dr. Reynolds is similar in some respects to surgery devised by Dr. L. N. Pyrah, professor of urology at Leeds University in England, and by Dr. Sidney Weinburg of New York University.

Science News Letter, March 28, 1959